

# 1961 CATALOG

***Vitro* ELECTRONICS**  
A DIVISION OF VITRO CORPORATION OF AMERICA

PRODUCERS OF **NEMS-CLARKE** EQUIPMENT  
919 JESUP-BLAIR DRIVE / SILVER SPRING, MARYLAND

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*Scientific Research*  
*and*  
*Test Equipment*





Vitro Electronics  
is diversified in  
the production of  
Scientific Research  
and Test Equipment

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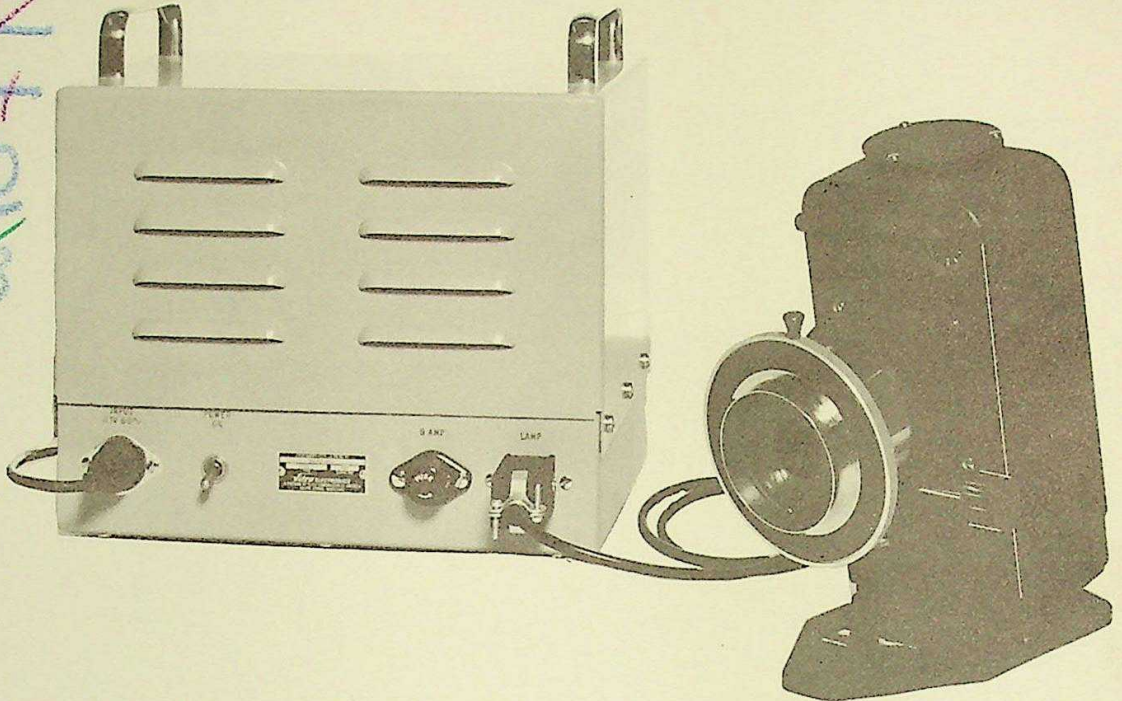
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1961 Catalog Vitro  
Electronics

## MERC-ARC HIGH INTENSITY LIGHT SOURCE

For Microscopy and Photomicrography

Average Brightness  
25 x 10<sup>3</sup> candles cm<sup>2</sup>



The Merc-Arc provides a source of continuous high intensity light for photomicrography and for normal viewing in microscopy. The mercury lamps used in this unit give a light-continuum throughout the visible spectrum with strong ultra-violet lines in the near and middle ultra-violet regions, making possible the effective use of daylight-type color films in photomicroscopy without the use of corrective filters.

Characteristic of this unit is the exceptionally small size of the light source, a factor in providing light of high intrinsic brilliance. The intensity of the light makes it particularly useful for darkfield, polarization, phase, and ultra-violet fluorescence microscopy or photomicroscopy.

The Type 520-P Merc-Arc has pyrex optical elements which withstand the intense heat generated by the mercury arc lamp.

The Nems-Clarke 520-Q Merc-Arc is fitted with quartz optical elements the characteristics of which make possible the full utilization of the ultra-violet portion of the spectrum, making the resulting light particularly useful where strong ultra-violet radiation is needed for fluorescence studies.

A small illuminator unit and an ac power unit comprise the Merc-Arc. The housing containing the lamp and optics is connected by a 2½ ft. long connecting cord making it possible to locate the larger power supply unit away from the work area near the microscope.

One feature of particular interest regarding the ac power supply is the use of a power-factor-correction capacitor which appreciably reduces the line current. This is particularly important when the illuminator is used on heavily loaded lines.

Where it is desired to obtain a pure, unmodulated light output, a dc converter unit is available for operation of the mercury arc lamp with dc current. This unit is connected between the ac power supply unit and the illuminator; thus the output of the ac unit is rectified and filtered, and the current flow limited to the proper value for lamp operation.

Both the power supply and the dc converter represent the utmost in careful design. All components operate well below their normal rating to insure long life and maximum efficiency.

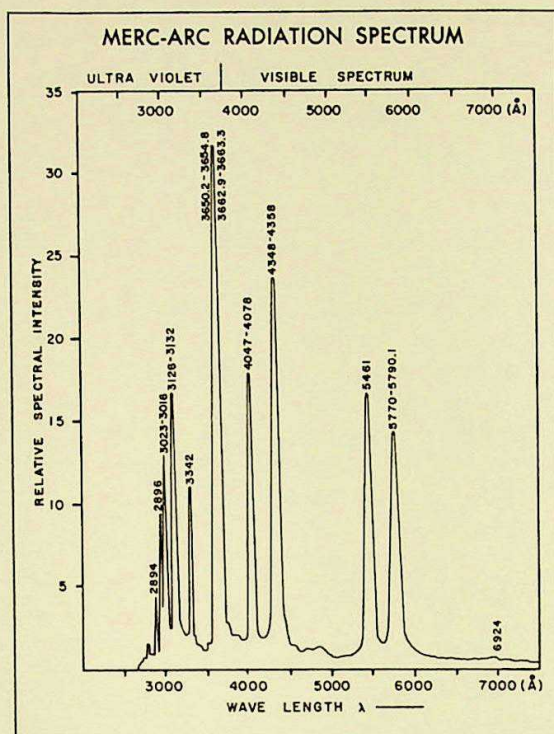
The illuminator housing is finished in instrument black. The power supply units are finished in attractive hard-gloss blue-gray enamel.

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### SPECIFICATIONS

Power Input .....	117 volts, 50-60cps less than 4.0 amp, AC rms
Lamp Operating Voltage .....	50-57v
Lamp Operating Current	
Osram HBO-200 Type L <sub>1</sub> .....	3.65, $\pm 5\%$ amperes
Osram HBO-200 Type L <sub>2</sub> .....	4.15, $\pm 5\%$ amperes
Apparent Power .....	230 VA
Real Power .....	200 watts
Luminous Flux .....	9500 lumens
Luminous Efficiency .....	47.5 lumens/watt
Luminous Intensity (perpendicular to lamp axis) .....	1100 candles
Average Brightness .....	$25 \times 10^3$ candles/cm <sup>2</sup>
Arc Dimensions .....	Height: 2.5 mm; Width: 1.3 mm.
Average Life .....	200 hours to 20% decrease in luminous flux

Distributed exclusively by American Optical Company, Distributors

### Prices:

**520-P MERC-ARC (Pyrex Optical): \$500.00**

**520-Q MERC-ARC (Quartz Optics): \$575.00**

dc Converter Unit (on special order only): Price on request

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# **PULSARC AND ZENARC**

## **LIGHT SOURCES FOR PHOTOMICROGRAPHY**

The Nems-Clarke PULSARC has been designed to meet a long-felt need for a light source for photomicrography which would provide a steady, high-intensity source of light for normal viewing and focusing capable of being pulsed at a very much higher input at the time the photographic exposure is made. The increased power in the pulse results in an increase in the intensity of the xenon-arc lamp without an appreciable increase in the size of the source. The increase in source brightness is approximately 36 times in the type 505-BP Pulsarc. The time of the light Pulse in the unit can be varied in four discrete steps up to a maximum of 135 milliseconds. Once initiated, the length of the pulse is independent of the operator. The pulse can then be synchronized by the camera shutter contacts.

The XENON-ARC LAMPS used in these light sources are designed for steady burning with all of the energy concentrated in a very small area rather than in the extended area used in most electronic flashtubes designed for singleflash operation. Such xenon-arc lamps are coming more and more into general use in Navy search-lights, motion picture projectors, and in other equipment where an intense source of light of small size is needed. The photographic effectiveness of the Pulsarc lamp, as normally used, exceeds by a factor of approximately 10, that of any electronic flash-tube of comparable size. In photomicroscopy, a conventional electronic flashtube is of little value, since a good optical system is difficult to design around a large area source.

Because the color temperature of the light source is close to that of daylight, photomicrographs can be made using high-speed color films. Normally, there is no need for any corrective filtering. The high intensity of the pulse xenon-arc, as used in the Pulsarc, makes photo-

graphic exposures possible in a fraction of the time needed for other sources previously used for photomicroscopy. Three pulses of 135-millisecond duration have been found to give emulsion density equal to a 30-second exposure using a ribbon-filament lamp. There is no appreciable heating of the specimen, vibration ceases to be a problem, and reciprocity failure of the film due to long exposure is eliminated.

The Pulsarc is offered with a choice of two different xenon-arc lamps. The specification table shows the differences in the source size and performance of the two lamps. The illuminators have been designed to offer every convenience to the microscopist. A smooth-working field-of-view diaphragm, and an adequate condensing lens with readily adjustable focusing mechanism are provided. Additional adjustments are provided for placing the arc on the optical axis, and for adjusting the mirror to super-impose the reflected image upon the transparent arc for greater intensity, or for displacing the image if it is desirable to increase the apparent size of the source. The unit operates cooler than conventional ribbon-filament lamp illuminators, since the conversion of electrical energy to light is much more efficient in an arc discharge than in a heated filament.

The ZENARC is designed for uses where the pulse feature of the Pulsarc is not required. With the exception of the omission of the pulsing circuits and the use of a different lamp, the Zenarc is identical to the Pulsarc and retains all the quality features, the same power supply, illuminator and general appearance.

*Other Uses* — The power supply and lamp unit of the Pulsarc or the Zenarc will find many uses in other fields, such as enlarging, projection, time-lapse photography, etc.

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# SPECIFICATIONS

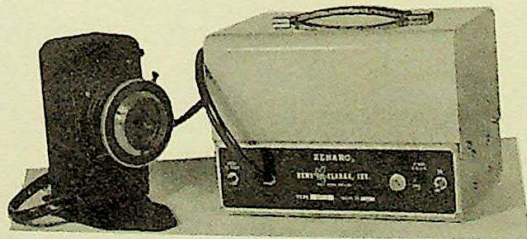
	NEMS-CLARKE 505-BP PULSARC	NEMS-CLARKE 505-HP PULSARC	NEMS-CLARKE 505-H ZENARC
Lamp Used	FA-5 Tube	510C1 Tube	510C1 Tube
Arc Dimensions Length Width, Continuous Width, Pulsed	5mm 3mm 4 mm	4mm 2mm 3mm	4mm 2mm
	Mirror image adjustable beside real image to effectively double arc width.		
Brightness Continuous Pulsed	1,000 candles/cm <sup>2</sup> 36,000 candles/cm <sup>2</sup>	5,000 candles/cm <sup>2</sup> 25,000 candles/cm <sup>2</sup>	5,000 candles/cm <sup>2</sup>
Minimum Time Between Pulses	15 second intervals	(Pulse length inaccurate at shorter intervals.)	
Lamp Life	Approximately 5,000 flashes at 15-second intervals	Approximately 200 hours, to 85% light output.	Approximately 200 hours, to 85% light output
Lamp Wattage Ratings	150w	150w	150w
Power Requirements of Power Supply	115v, 60cps	117v, 60 cps	177v, 60 cps

## Prices:

505-BP PULSARC .....	\$625.00
Power Supply only .....	410.00
Illuminator only, with lamp .....	215.00
505-HP PULSARC .....	700.00
Power Supply only .....	420.00
Illuminator only, with lamp .....	280.00
505-H ZENARC .....	\$610.00
Power Supply only .....	320.00
Illuminator only, with lamp .....	290.00

## LAMPS

FA-Tube (for 505-BP) .....	35.00
510C1 Tube (for 505-HP and 505-H) .....	85.00



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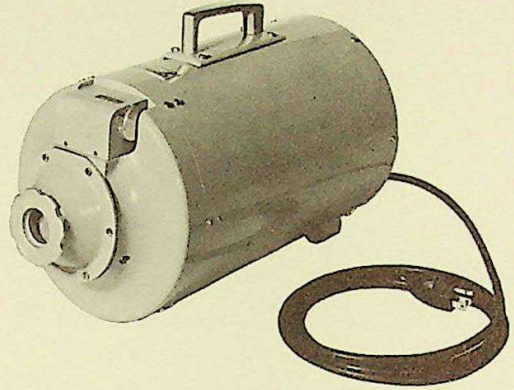
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# AIR PARTICLE SAMPLER

## NEMS-CLARKE APS-11

The Nems-Clarke APS-11 Air Particle Sampler is used to collect radioactive particles from the air while measuring the volume of air from which the radioactive particles were extracted. It is designed for continuous 24-hour operation and features long-life, ruggedness, accuracy, and portability. The air metering rate of 16,800 liters (16.8 cubic meters) per hour is essentially constant due to the high efficiency of the cylindrical nine-stage turbine. The turbine turns in ball bearings at a relatively low rate of speed.



In place of a rate of flow metering device ordinarily used in units of this type, the APS-11 employs a rugged, reliable metering system which indicates the total volume of air that has passed through the filter during the sampling period. The reading appears on a resettable counter calibrated in cubic meters. Indicators calibrated in cubic feet are available also.

The absence of sparking commutators eliminates radio interference. Acoustic noise, because of the low rate of speed and ball bearing design is only that of a 3400 rpm motor driving a well-balanced turbine running on ball bearings. It can be equipped with either standard or explosion-proof motor as required. The filter holder is approximately two inches in diameter, but filter holders of any practical size or configuration can be furnished.

### SPECIFICATIONS

Collection Rate—16,800 liters (16.8 cu. meters) per hour

Meter—Resettable counter-type totalizer operating from measuring turbine. (Flow meter adjustable for calibration purposes.) Counter capacity, 99.9 cubic meters. Meter also available with calibrations in cubic feet—999 total.

Motor—3400rpm induction, 115v, 50-60 cycle. Either standard or explosion-proof types supplied as required.

Size—18½ inches long, 8½ inches wide, and 11¼ inches high (9¼ inches high without handle).

Weight—25 pounds.

Price: \$500.00 with Standard Motor

Price: \$800.00 with Explosion-Proof Motor

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